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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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BAE SYSTEMS PO BOX 868 NASHUA, NH 03061-0868			EXAMINER MANCUSO, HUEDUNG XUAN CAO	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,526	Applicant(s) ZINK ET AL.	
	Examiner HUEDUNG Cao MANCUSO	Art Unit 2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Response to Arguments***

1. Applicant's remarks have been fully considered but are not convincing. Firstly, the applicant is arguing that "bent" means that the antenna are bent out of the plane of the antenna. However, this is not required by the claims and when given their broadest reasonable interpretation, particularly in view of the various 112 issues, if the antenna is not straight it can be said to be "bent" and the antenna of the references are non-linear which would meet the claim language. If a more specific interpretation of the term "bent" is desired, it is suggested that the claims be amended to recite the actual desired meaning, assuming that it has support in the originally filed disclosure. As to the arguments directed to "cavity", this too is being argued more specifically than is actually claimed. A "cavity", giving it its broadest reasonable interpretation, only requires a hole or opening of some sort. This would be met by the references as applied because the substrate of Luen has an opening into which the antenna elements are embedded. While the embedding of the antenna may well fill the cavity it does not eliminate the presence of the cavity.

The new grounds are based upon the newly amended and added claims. As to new claim 14, this claim is basically the same as previously presented claim 3 and neither claim 3 nor claim 14 were specifically argued in the applicant's response. Additionally, the previous 112, 1st, rejections of claims 2-3 (where new claims 12 and 14 recite similar limitations) were not addressed in the applicant's remarks and these rejection are also maintained. It is noted that

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while only examples from claim 1 was specifically cited in the rejection, all of these claims were rejected in the previous office action.

Drawings

2. The elements recited in new claim 4 of “ground plane”, “aperture in the ground plane”, a “downwardly-dependent vertical plate ...”, in claims 5 and 11 the “capacitively coupled” and the limitations in claims 6-7 are not shown in the figures.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the aperture in the ground plane, a downwardly-dependent vertical plate must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet”

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pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5-8 are rejected under 112, 2nd. These claims depend, directly or indirectly upon cancelled claim 2, and are therefore unclear as to what they are intended to recite. Further, since they depend upon a cancelled claim, they are replete with terms (like “said plate” and “the adjacent bow tie element”, for example) that lack antecedent basis. These claims are treated with regard to the prior art as best that they can be understood.

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 4-11, 12, 13 14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not

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described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 4-11, 12, 13 14 is rejected as lacking an enabling disclosure.

For claim 14, there is no disclosure in the originally filed specification of a structurally-embedded conformal antenna with “a selectively loaded cavity having less than 10% of the cavity volume comprised of absorbing material while maintaining pattern symmetry”. There is no disclosure of how the antenna would be constructed or be designed to operate “while maintaining pattern symmetry”. There is also no disclosure of the cavity “having less than 10% of the cavity volume comprised of absorbing material”. Further, this claim language is broad enough to encompass the cavity having zero “absorbing material” which is also not disclosed or contemplated by the specification.

Similarly, for claim 12, there is no disclosure in the originally filed specification of the specific sizes recited in this claim. As written, it appears that the claimed dimensions are for the while antenna, though this is not completely clear and the claim could be interpreted to be describing the size of the cavity. Either way, this is not disclosed or enabled in the original specification. Even if these dimensions were disclosed, the specification still would not enable how to make a device of this size.

As to claim 4, this claim depends upon claim 1, and recites the addition of “a bow tie antenna having ...” to the antenna of claim 1 that already recites “a crossed pair of center-fed end-loaded bent-dipole radiators which are ...”. However, the specification does not disclose an antenna that is comprised of “a crossed pair of center-fed end-loaded bent-dipole radiators” and ““a bow tie antenna”. At most, the originally filed specification discloses “a crossed pair of

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center-fed end-loaded bent-dipole radiators”. There is no disclosure of a “bow tie antenna” in combination with “a crossed pair of center-fed end-loaded bent-dipole radiators”, and the term “bow tie antenna” does not even appear in the originally filed specification. Claims 5-11, 13 also recite the added use of a “bow tie antenna” which is not described in the original specification.

7. Claim 4-11 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 4-11 have been amended to recited “a bow tie antenna having ...” which does not appear to be in the originally filed specification. Thus, the recitation must be treated as “new matter”. However, if the applicant does not believe that this subject matter is “new matter”, an appropriate explanation is required including pointing out where support for this subject matter can be found in the origin specification.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 12, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrews (US 6844858 B2) in view of (Luen, US 7369086).

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These claims are treated with regard to the prior art as best that they can be understood in view of the various 112 issues indicated above.

As to claim 1, Andrew teaches an antenna comprised of a crossed pair of center-fed end-loaded bent-dipole radiators (100, 105) which are structurally embedded into a cavity, whereby broadband, dual independent polarized, and hemisphere field-of-view coverage are provided (see col. 9, lines 6-27). It is noted that Andrew does not explicitly disclose the dipole radiators are embedded into a properly loaded cavity. Luen teaches such dipole radiators are embedded into cavity is widely used in the art (see Luen, abstract, and fig. 2 and see remarks above). To one of ordinary skill in the art it would have been obvious to combine Luen's teaching with Andrew in order to achieve the antenna system as designed. Further, the phrase "whereby broadband, dual independent polarized, and hemisphere field-of-view coverage are provided" is functional language (see MPEP 2114 "While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function") and does not necessarily distinguish the claimed apparatus from the prior art. It is noted that many of the limitations in the other claims are also just functional language and are similarly treated.

As to claim 12, a low-profile electrically small cavity antenna measuring $0.17 \times 0.17 \times 0.05$ wavelengths while Andrew or Luen do not specify the exact size of the cavity for the antenna, the exact size is something that one of ordinary skill in the art would know how to best design for the optimum operation of the device when taking into consideration the size available for the device and the preferred cost in making the device.

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As to claim 14, a structurally-embedded conformal antenna with a selectively loaded cavity, whereby less than 10% of the cavity volume is comprised of absorbing material while still maintaining pattern symmetry while Andrew or Luen do not specify the exact size of the cavity for the antenna, the exact size is something that one of ordinary skill in the art would know how to best design for the optimum operation of the device when taking into consideration the size available for the device and the preferred cost in making the device.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claim 5 is rejected under 35 U.S.C. 102(b) as being anticipate by Jack et al. (US 6329649).

This claim is treated with regard to the prior art as best that they can be understood in view of the various 112 issues indicated above. Since claim 5 depends upon a cancelled claim, it would be just a guess as to what claim the applicant intended this to depend upon. Therefore, it will be treated on its own with no parent claim.

As to claim 5, wherein said plate is capacitively coupled to the adjacent bow tie element, Jack shows in at least Fig 1E and col. 7, lines 4-32.

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12. Claims 6, and 7 are rejected under 35 U.S.C. 102(b) as being anticipate by Ippolito et al. (US 6072439).

This claim is treated with regard to the prior art as best that they can be understood in view of the various 112 issues indicated above. Since claim 6 depends upon a cancelled claim, it would be just a guess as to what claim the applicant intended this to depend upon. Therefore, it will be treated on its own with no parent claim.

As to claim 6, the antenna further including a second bow tie antenna orthogonal to said first bow tie antenna, said second bow tie antenna having respective downwardly-depending vertical plates at the distal ends of the bow tie elements thereof, see Figs. 4a-c, 5-6 and col. 5, lines 12-39.

As to claim 7, further including a second bow tie antenna coplanar with the [a] first bow tie elements of said first-mentioned bow tie antenna and orthogonal thereto in a quad configuration, see Figs. 4a-c, 5-6 and col. 5, lines 12-39.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ippolito et al. (US 6072439) in view of Jack et al. (US 6329649)

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This claim is treated with regard to the prior art as best that they can be understood in view of the various 112 issues indicated above. Since claim 8 depends ultimately upon a cancelled claim, it would be just a guess as to what claim the applicant intended this to depend upon. Therefore, it will be treated on its own with no parent claim.

As to claim 8, the antenna of Claim 7, wherein adjacent edges of the bow tie elements of said first and second bow tie antennas define a slot, while Ippolito discloses the system of claim 7, it does not explicitly disclose the limitation of claim 8. However, Jack, like Ippolito discloses a bow tie antenna. Jack further discloses this limitation in Figs 1a and 1e. To one of ordinary skill in the art it would have been obvious to provide slots between the bow tie elements because of the conventionality of such designs and because of the known advantages of slots in antenna structures.

15 Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrews (US 6844858 B2) in view of (Luen, US 7369086) and further in view of Ippolito et al. (6072439).

As to claim 9, wherein said bent dipole antenna includes a bow tie antenna, while the combination of Andrews and Luen teaches claim 1, it does not explicitly disclose that that the “bent dipole antenna includes a bow tie antenna”. However, the use of a a bent dipole with a bow tie antenna is a known configuration as shown by Ippolito. See Figs 4-6 and col. 4, lines 48-60 and col. col. 5, line 65-col. 6, line 20. To one of ordinary skill in the art it would have been obvious to make this configuration because this will enhance the configuration as explained in the above citations to Ippolito. As to claim 10, the same reasoning as for claim 9 applies.

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As to claim 10, this is rejected for the same reasons as claims 1 and 6.

Claims 4 and 11 are not currently rejected over prior art.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUEDUNG Cao MANCUSO whose telephone number is (571)272-1939. The examiner can normally be reached on 6:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas Owens can be reached on (571) 272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Huedung Cao Mancuso/
Primary Examiner, Art Unit 2821